DALI-2 EM Guard

Datasheet

DALI-2 Emergency Monitoring

DALI-2 Emergency Monitoring Device
with integrated DALI bus power supply

Art. Nr. 87458642

# **DALI-2 EM Guard** DT1 Monitor and Bus Power Supply

Overview

- Monitoring for emergency lighting systems: Display of the emergency lighting system status via LED on the device and via DALI Cockpit

- Start emergency light function tests and duration test via button on the device

- Status information and configuration with DALI Cockpit software (test periods, error case selection,...)

- Changeover relay in case of error status

- Integrated DALI bus supply (220mA) suitable for supplying a complete DALI circuit with 64 standard DALI devices

- Suitable for DIN rail mounting

- Supply voltage range of 120Vac … 240Vac for worldwide use

- Immune to mains surges up to 400V

CE UKCA DALI2

Specification, Characteristics

type	DALI-2 EM Guard
article number	87458642

input: L, N	
input type	supply, mains voltage
marking input terminals	L, N
input voltage range	120Vac … 240Vac
max. input supply current	40mA (@120Vac), 20mA (@240Vac)
input supply frequency	50Hz / 60Hz
max. power consumption	5,3W
start-up time	250ms

| output: DA+, DA-	
output type	DALI power supply
marking output terminals	DA+, DA-
output voltage range	12Vdc … 20,5Vdc
DALI supply current	250mA
guaranteed DALI supply current	200mA
max. DALI supply current	250mA
open circuit proof	yes
short circuit proof	yes
shutdown-mechanism	yes

output: changeover relay

output type	changeover relay
marking output terminals	
relay output switch on/off voltage	HW V1 :125Vac/110Vdc **HW V2: 250Vac**
max. nominal load	HW V1: 62.5VAac/30Wdc **HW V2: ---**
max. switching current	HW V1: 1A(bei 30Vdc)/0.5A(bei 125Vac) **HW V2: 5A**
type of relay contact	1 changeover
switching operations at nominal load, resistive	HW V1: >10^5 **HW V2: >15*10^6**

isolation data

impulse voltage category	II
pollution degree	2
rated insulation voltage	250V
rated impulse withstanding voltage	4kV
insulation DALI / mains	reinforced isolation
Insulation test voltage DALI / mains	3000Vac

environmental conditions

storage and transportation temperature	-20°C … +75°C
operating ambient temperature	-20°C … +55°C
rel. humidity, none condensing	15% … 90%

general data

dimensions (l x w x h)	98mm x 17,5mm x 56mm
mounting	DIN rail
rated maximum temperature tc	75°C
expected life time @tc	50.000 h
protection class	II in intended use
protection degree housing	IP40
protection degree terminals	IP20

terminals

connection type	screw connector
wire size solid core	0,5 … 2,5 mm^2 (AWG20 … AWG14)
wire size fine wired	0,5 … 2,5 mm^2 (AWG20 …AWG14)
wire size using wire end ferrule	0,25 … 1,5 mm^2
stripping length	7 mm / 0,27 inch
locking torque	0,5Nm
release of wire	open screw

standards

DALI	EN 62386-101:2014
EMC	EN 61547 EN 50015 / IEC CISPR15
safety	EN 61347-2-11 EN 61347-1
markings	DALI-2, UKCA, CE
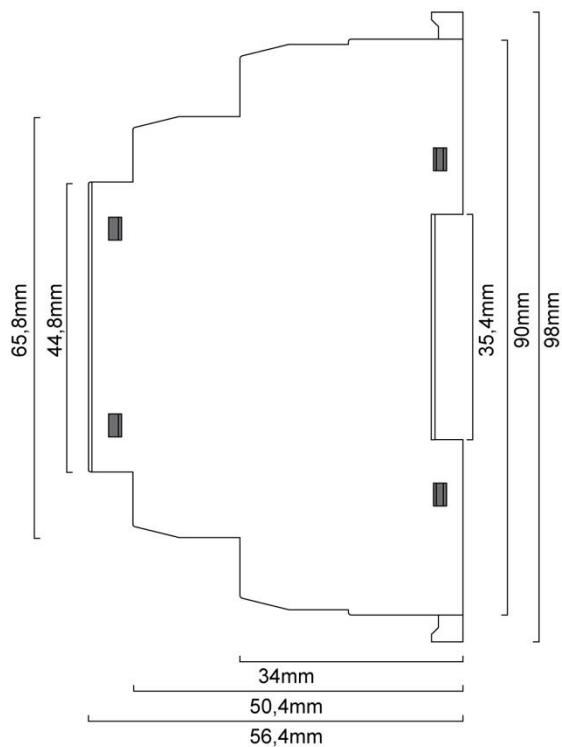
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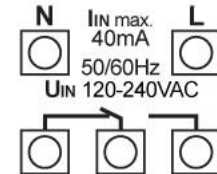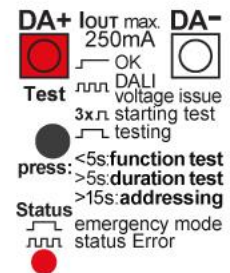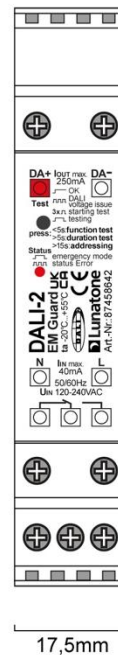
connectors
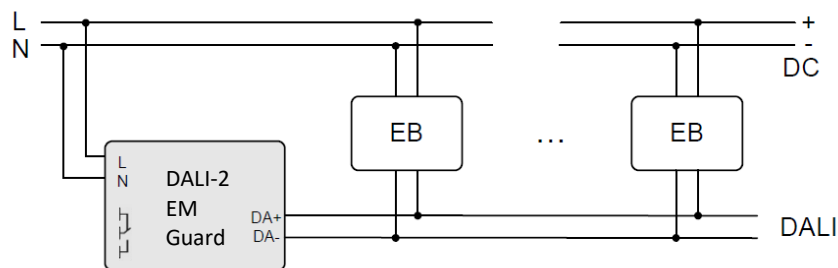
Wiring diagram

Factory Default Settings

Number of lights to monitor	0 (needs to be configured during commissioning)
Testing frequency	0 (50ms between the emergency light query sequence and 50ms between each command of the sequence)
Considered an error	All (emergency light device error, battery duration error, battery error, time-out during function test, time-out during duration test, function test failed, duration test failed)

Installation

- The DALI-2 EM Guard is intended for DIN rail mounting

- Ensure protection against electric shock by an appropriate enclosure

- The wiring should be carried out as a permanent installation in a dry and clean environment.

- Installation may only be carried out in a voltage-free state of the system and by qualified specialists.

- National regulations for setting up electrical systems must be followed.

- Connect power supply terminals L and N to mains voltage according to the labelling.

- the polarity of the output voltage is marked on the housing (DA+, DA-).

- Make sure that the guaranteed supply current exceeds the current consumption of all bus devices.

- The DALI line may be routed together with the mains voltage (in one cable or as single wires in a tube)

- The DALI-line must **not** be connected to the mains or extra low voltage systems.

- The DALI wiring can be realised with standard low-voltage installation material. No special cables are required.

- Wiring topology of the DALI-line: Line, Tree, Star

☞ **Attention:** The DALI-signal is not classified as SELV circuit (Safety Extra Low Voltage). Therefore, the installation regulations for low voltage apply.

☞ The voltage drop on the DALI line must not exceed 2V at maximum length (300m) and maximum bus load (250mA).

Commissioning

The DALI-2 EM Guard is ready for use after connecting. To monitor the emergency lighting system, the number of emergency lighting devices must be set once via the DALI Cockpit (see "Addressing via DALI Cockpit") or by addressing via the button on the device (see "Addressing via device button").
On power up the DALI EM Guard performs a self-test, both LEDs flash and the relay switches. During operation, the LEDs display the following information:

- **Test-LED**
  - **off**: device is not powered
  - **constant on**: DALI voltage ok (and non of the monitored devices is currently carrying out a test)
  - **short flashing**: DALI supply voltage not ok
  - **flashing 3times**: a test was started
  - **long flashing**: one or more emergency lighting devices are carrying out a test. (functional or duration test)

- **Status-LED**
  - **long flashing**: one or more devices are in emergency light mode / battery powered
  - **short flashing**: status error
  - **constant on**: status ok
  - **off** (after extra long button press 15s): device initializing /addressing, see section "Addressing via device button"

- **Button on the device:**
  - **short press** (<5s): starts function test for all emergency-light gears (broadcast)
  - **long press** (> 5s): starts duration test for all emergency-light gears (broadcast). The test is triggered by pressing a button; whether the test is carried out immediately depends on the emergency lighting device (e.g. if the battery is not fully charged, the test is postponed).
  - **extra long press** (> 15s): start addressing – newly addressing the system (old addresses are deleted).

Addressing via DALI Cockpit
When using the [DALI Cockpit Software](#), the PC must be connected to the DALI bus via a suitable interface module ([DALI-2 USB](#); [DALI USB](#), [DALI-2 WLAN](#), [DALI-2 Display](#), [DALI-2 IoT](#), [DALI 4Net](#), [DALI SCI RS232](#)). The EM Guard is automatically recognised by the DALI Cockpit during the addressing process and listed in the device overview.

The number of emergency lights must be set in the DALI Cockpit on the DALI-2 EM Guard device page, tab "Status" (see also Figure 2).

Additionally status information can be read out and the behavior in the event of an error can be configured, see section "Functionality" and Figure 1 and Figure 2 on page 7.

Addressing via device button
Once connected, the DALI system can be addressed and the number of emergency lighting devices can be registered via the button on the DALI-2 EM Guard without additional commissioning software.

Prerequisite: the DALI DT1 "Identify" state must be supported by all emergency lighting devices used, e.g. flashing of an additional LED on the device or the lamp itself. This state is not necessarily available for all emergency lighting devices.

Step 1: Extra long press of the button on the DALI-2 EM Guard, >15s, until the status LED goes out: addressing is started.
Attention, all devices (16-bit gears) on the DALI bus are newly addressed including devices that are not emergency lights (DT1). This process can take several minutes depending on the number of devices. During addressing, no other devices (e.g. DALI Cockpit, central control, ...) may send on the DALI bus.

Step 2: After addressing, all emergency lighting devices found, are put into the "Identify" state.
The indication/flashing of the emergency lighting devices in "Identify" state, can be used to check whether all emergency lighting devices in the system have been found and addressed.
The "Identify" state can then be acknowledged with a short press of the DALI-2 EM Guard button.
If not all emergency lighting devices were in "Identify" state, the wiring should be checked and addressing carried out again. Otherwise, it cannot be guaranteed that all DT1 devices are being monitored by the DALI-2 EM Guard.

When the "Identify" is completed, the number of emergency lighting devices found is registered in the DALI-2 EM Guard and the status of these devices is queried (duration: several minutes, depending on the number of devices). The status LED changes from OFF to the respective state.

Switching output – changeover relay
In the event of an error, the signal can be passed on to a higher-level control unit via the switching output.

Displayed error cases
The following situations are considered error cases:
- no devices on the DALI bus
- too many or too few devices on the DALI bus: more or fewer devices respond than were registered during addressing/commissioning
- no power supply to the EM Guard
- all failure feedback from the emergency devices selected as error cases (see section: "Error case selection " page 7).

Starting Emergency Tests via the DALI Bus
If the function of duration tests need to be started not on the device button but via a different source on the DALI bus, a pushbutton coupler [DALI-2 MC](#) or Timer [DALI-2 RTC+](#) can be used to send the necessary DALI commands to start a test (Enable DT1 + 2x Start Function Test, Enable DT1 + 2x Start Duration Test). The DALI-2 EM guard will display the result as configured.

Functionality

The DALI-2 EM Guard is suitable for monitoring emergency lights (DALI DT1) and displaying the status. The interval at how often the emergency lights are checked for errors can be set in the DALI Cockpit. To detect the absence of individual emergency lights, the total number of installed emergency lights must be set via the DALI Cockpit or by addressing via the device button, see section "Commissioning".

Interval between Queries
The interval between the query sequences (query of all registered emergency lighting devices in the system) can be set between 0 (= 50ms), 1min, 2min, ... 60min.
The time between the individual queries in the sequence is always 50ms.

Input Emergency Lighting devices and view Status
On the DALI Cockpit device page, tab "Status" (see Figure 2) the number of emergency lighting devices to be monitored needs to be entered once during commissioning. Errors are then listed here. The "general status" display shows the evaluation according to the error cases selected in the tab "Settings".

Error case selection
On the DALI Cockpit device page, tab "Settings", it can be configured which emergency device cases should be considered as error cases, see Figure 1. The selected error cases when occurring are then displayed via the status LED on the device (see also section "Commissioning" – "Status LED" page 5).

Figure 1 DALI Cockpit tab Settings

Figure 2 DALI Cockpit tab Status

Purchase Order Information

Art.Nr. 87458642: DALI-2 EM Guard, emergency light (DT1) monitoring, integrated DALI bus power supply (220mA), DIN rail

Additional Information and Equipment

DALI-Cockpit – DALI system configuration tool, free when using a Lunatone interface device
https://www.lunatone.com/en/product/dali-cockpit/

Lunatone DALI products
http://www.lunatone.com/en

Lunatone datasheets and manuals
http://www.lunatone.com/en/downloads-a-z/

Contact

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Disclaimer

Subject to change. Information provided without guarantee. The datasheet refers to the current delivery.

The function in installations with other devices must be tested for compatibility in advance.